Name: Date:

Polynomial Factoring solution (version 7)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 30 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(30)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 120}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-20}}{2}$$

$$x = \frac{10 \pm \sqrt{-4 \cdot 5}}{2}$$

$$x = \frac{10 \pm 2\sqrt{5}\, i}{2}$$

$$x = 5 \pm \sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 + 3i$ and $-7 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-5 + 3i) \cdot (-7 + 4i)$$

$$35 - 20i - 21i + 12i^2$$

$$35 - 20i - 21i - 12$$

$$35 - 12 - 20i - 21i$$

$$23 - 41i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 5x - 6$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	2	-5	-6
-3		-3	3	6
	1	-1	-2	0

$$f(x) = (x+3)(x^2 - x - 2)$$

$$f(x) = (x+3)(x+1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+4)^2 \cdot (x+1) \cdot (x-2)$$

Sketch a graph of polynomial $y = p(x)$.